

That Which is Claimed is:

1. A method for providing an injection from a medical device, comprising the steps of:

providing a medical device comprising a barrel, a retractable needle, a mounting stem having a connector that is cooperable with a cartridge containing a quantity of medicinal fluid, wherein the mounting stem is spaced apart from the barrel to provide an annular passage and the device comprises an arm connected with the mounting stem and releasably engaging a recess in the barrel to retain the stem in a fixed axial position relative to the barrel during an injection;

providing a cartridge containing a quantity of medicinal fluid, comprising a fluid container and a seal comprising a connector cooperable with the connector on the stem;

attaching the cartridge to the mounting stem by connecting the seal connector with the stem connector;

displacing the fluid container forwardly through the annular passage until the fluid container engages the arm, whereby while the fluid container is displaced forwardly the stem maintains the seal in a fixed axial position;

displacing the fluid container further forwardly after the fluid container engages the arm so that the fluid container displaces the arm, disengaging the arm from the recess and effecting release of the needle; and

retracting the needle after release by means of a biasing element biasing the needle rearwardly.

2. The method of claim 1 comprising the step of piercing the seal to provide fluid communication between the fluid container and the needle.

3. The method of claim 1 wherein the fluid container comprises a fluid chamber having a length and extending from the rearward end of the

seal to the rearward end of the container, and wherein the step of displacing the fluid container comprises displacing the fluid container forwardly a distance that is substantially similar to the length of the fluid chamber.

4. A method for providing an injection from a medical device, comprising the steps of:

providing a medical device comprising a barrel, a needle having a sharpened tip projecting forwardly from the barrel, a biasing element biasing the needle rearwardly, and a mounting stem disposed within the barrel; releasably retaining the mounting stem in a fixed axial position relative to the barrel by an arm attached to the mounting stem and engaging a recess in the barrel;

providing a cartridge comprising a fluid container containing a quantity of medicinal fluid and a slidable seal forming a fluid-tight seal with the container;

attaching the seal to the stem to connect the cartridge to the medical device; retaining the seal in a fixed axial position while displacing the fluid container forwardly over the seal to expel the fluid from the container and through the needle; and

displacing the fluid container further forwardly after the fluid container engages the arm, thereby disengaging the arm from the recess and causing the needle to be released for retraction.

5. The method of claim 4 comprising the step of retracting the needle so that the sharpened tip of the needle is retracted into the barrel.
6. The method of claim 4 comprising the step of piercing the seal to provide fluid communication between the fluid container and the needle.

7. The method of claim 4 wherein the fluid container comprises a fluid chamber having a length that extends from the rearward end of the seal to the rearward end of the container, and wherein the step of retaining the seal while displacing the fluid container comprises displacing the fluid container forwardly a distance that is substantially similar to the length of the fluid chamber.
8. A medical device for providing an injection of fluid, comprising:
 - a hollow housing having a central axis;
 - an ampoule of fluid comprising a container having a length, an open end forming a rim and a plug sealing the open end, wherein the container comprises a fluid chamber having a length that extends from a rearward end of the plug to the rearward end of the container;
 - a needle having a sharpened tip operable between a projecting position in which the sharpened tip projects forwardly from the housing and a retracted position in which the sharpened tip is shielded against inadvertent contact;
 - a biasing element biasing the needle toward the retracted position;
 - a stem disposed within the housing configured to matingly engage the ampoule plug to attach the plug to the stem wherein the stem is operable in connection with the ampoule to provide an injection of fluid through the needle from the ampoule by displacing the ampoule forwardly relative to the stem; and
 - a latch releasably retaining the stem at a fixed axial position during the injection wherein when the ampoule is mounted on the stem, the latch is spaced from the rim of the container a distance substantially similar to the length of the fluid chamber so that at the end of the injection the ampoule engages the latch;
 - wherein after the ampoule engages the latch, continued forward displacement of the ampoule operates to effectuate release of the needle.

9. The medical device of claim 8 wherein the housing comprises a recess cooperable with the latch.
10. The medical device of claim 8 comprising a centering element extending radially relative to the stem for maintaining the stem aligned parallel with the axis of the housing.
11. The medical device of claim 8 comprising a needle retainer releasably retaining the needle in the extended position against the bias of the spring.
12. The medical device of claim 8 wherein the plug has a piercable wall for providing access to the medicine in the ampoule.
13. The medical device of claim 12 comprising a piercing element projecting from the stem that is operable to pierce the wall of the plug.
14. The medical device of claim 13 wherein the piercing element is in fluid communication with the sharpened tip.
15. The medical device of claim 8 wherein the container comprises a closed end forming a manually operable surface for displacing the container relative to the housing.
16. The medical device of claim 8 wherein the rearward end of the housing is open, forming a socket for receiving the ampoule.